

Pipe-connecting device

5 The invention relates to the technical field of
filtration systems for swimming pools.

10 More specifically, the invention relates to the compact
water filtration units used in swimming pools. These
units comprise, in a known way, a "filtration"
15 compartment and a "pumping" compartment. The filtration
compartment is designed to be submerged in the water of
the swimming pool. This compartment houses one or more
filtration means of any appropriate known type. The
pumping compartment is situated on the outside of the
15 swimming pool. It is usually buried, and has one or
more pumps for sucking the water in and returning it,
as indicated in the rest of this description. The
pumping and filtration compartments are connected by a
common part which usually straddles the walls of the
20 swimming pool, whatever its specific design. This part
of the overall filtration unit has the shape, very
approximately, of an upside-down staple. Examples of
this type of filtration unit can be found in the
teachings of patents FR 97.01642, FR 98.03790 and FR
25 99.12856.

In essence, the filtration means, whatever its
particular design, is connected, by pipe elements, to
the pump or pumps installed in the pumping compartment.
30 More particularly, these pipe elements are connected to
the suction intake of the pump. Other pipe elements are
connected to the pump's return outlet where the
filtered water is returned to the swimming pool by
means of for example nozzles on a part of the
35 filtration compartment.

Clearly, the suction and return pipe systems are made
up of several elements connected by elbows or the like

- to form the connection between the filtration compartment and the suction compartment. For reasons of ease of installation and to keep costs down, these pipe elements are of round section and advantageously made of PVC, conforming with standard components as widely available in the trade. Specifically, the use of this kind of round-section pipe element keeps costs down and enables different types of connection to be made.
- 10 Because of the need to make a circuit to carry the water between the filtration compartment and pumping compartment, the suction and return pipes are also present in the common connecting part between the two compartments. In this area the suction and return pipes are usually placed side by side in a horizontal plane.

As a result, these round-section pipes occupy a certain height, so that the common connecting part appears above the edge of the swimming pool. The same is also true of the filtration and pumping compartments.

In other words, the filtration unit as a whole, in the prior art, must project high enough to allow the suction and return pipes to pass across. This excess height is not always very appealing to the eye and can interfere with the integration of the complete filtration unit in the coping and areas around the pool.

30 It is an object of the invention to solve these problems in a simple, safe, effective and efficient manner.

35 The problem which the invention seeks to solve is how to minimize the height of the connecting part between the filtration and pumping compartments, in such a way that the filtration unit as a whole hardly shows above the surrounding areas for example, while not increasing production costs, in other words keeping open the

possibility of making the suction and return circuits largely from round-section pipe elements of the type commonly used in the trade.

- 5 To solve this kind of problem, a device for connecting suction and return pipes, particularly between two compartments of a filtration unit, has been designed and developed, the said device comprising a module of thin flat cross section defining at least one
10 open-ended internal conduit, the said conduit or conduits having members for watertight connection with flat-section connectors, the said connectors being fixed to the suction and return pipes, and the said module being arranged between the two compartments, at
15 the common linking part.

Advantageously, in response to the problem of how to separate the suction and return circuits, the module defines, in section, two separate internal conduits,
20 each conduit having the members for connection to the flat-section connectors, for the connection to the suction and return pipes positioned in the filtration and pumping compartments.

- 25 To solve the problem of how to connect the module as a whole to the suction and return pipes, the connecting members of the module are flat, especially rectangular, section adaptors in communication with the conduits.

- 30 Advantageously, the flat-section connectors are made integral, directly or by being connected, with round-section adaptors able to be connected by watertight engagement with the pipe elements of complementary section.

- 35 To solve the problem of how to facilitate the installing and connection of the various suction and return pipes, without increasing costs, the module is an independent add-on element fixed in a watertight

manner to the common connecting part, between the two compartments.

5 Advantageously, the module has in section a profile able to fit in a complementary profile serving as a bearing cradle formed in the thickness of the common connecting part.

10 In one particular embodiment of the whole filtration unit, the module and the two compartments are connected together by a common linking frame fitted with covers for closing each of the said compartments.

15 The invention is set out below in greater detail with the aid of the figures of the attached drawings, in which:

- Figure 1 is a perspective view of all the elements of the connection device;
- Figure 2 is a transverse cross section on the
20 plane marked 2-2 in Figure 1;
- Figure 3 is a cross section on the plane marked 3-3 in Figure 1, following connection of the corresponding pipe parts;
- Figure 4 is a longitudinal cross section through
25 an example of an embodiment of a compact filtration unit equipped with the device;
- Figure 5 is a transverse cross section on the plane marked 5-5 in Figure 4; and
- Figure 6 is a diagrammatic perspective view of an
30 example of the application of the connection device to a compact filtration unit.

As will be fully familiar to those skilled in the art, this type of filtration unit essentially comprises a
35 compartment (A) submerged in the water and known as the "filtration compartment", and a compartment (B), situated on the outside of the swimming pool and generally known as the "pumping compartment". The two compartments (A) and (B) are connected together by a

common connecting part (C) to form a single block. The pumping compartment (B) is usually designed to be buried in the ground.

5 The filtration compartment (A) comprises, as is known very well, one or more filtration means (F), which may take various forms. The pumping compartment (B) houses one or more pumps (P) for sucking the water out of the swimming pool, it having passed en route through one or
10 more filters (F), and returning the filtered water to the swimming pool, by means of, for example, a return nozzle (R).

The swimming pool water suction and return circuit, in
15 combination with the filtration (F) and pumping (P) means, essentially follows a suction pipe (1) connected to the pump (P) suction intake, and a return pipe (2) connected to the pump (P) return outlet. The pipes (1) and (2) are largely made up of round-section elements
20 of the type widely sold in the trade and their diameter is determined as a function of the flowrate.

According to the invention, the problem addressed by the invention, as indicated, is how to minimize the
25 height of the common connecting part (C) between the compartments (A) and (B), emphasizing that this common connecting part (C) usually has, either directly or by an attachment, members (3) for the watertight separation of the two compartments (A) and (B), notably
30 in order to avoid any risk of the water filling the filtration compartment and spilling over into the pumping compartment. Such members are thoroughly familiar to those skilled in the art, as can be seen for example by the teaching of the patents cited
35 earlier.

Given this configuration, therefore, it can be seen that the suction (1) and return (2) pipes are constructed in the form of two parts or assemblies (1a,

1b) and (2a, 2b). Part (1a) of the suction pipe is situated in the filtration compartment, while part (1b) is situated in the pumping compartment. In the same way, part (2a) of the return pipe is situated in the filtration compartment, while part (2b) is situated in the pumping compartment.

It is important therefore to connect up the two parts (1a) and (1b) on the one hand, and (2a) and (2b) on the other, as they negotiate the members (3), within the smallest height possible, as indicated.

According to the invention, the device for connecting the suction (1a, 1b) and return (2a, 2b) conduit parts has connecting members that are thinner than the diameter of the various pipe elements (1) and (2).

In a preferred embodiment, the connecting device denoted as a whole by (4) comprises a module of flat transverse section, with a thickness (e) that is less than the diameter (d) of the component elements of the pipes (1) and (2). This module is hollow and defines, in section, at least one, but preferably two internal and separate conduits (4a) and (4b). On either side of the body of the module (4), the conduits (4a) and (4b) have members (4c) and (4d) for watertight connection to the flat-section connectors (5). The connectors (5) are fixed in a watertight manner, by any appropriate known means, to the parts (1a) and (1b) of the suction pipe and to the parts (2a) and (2b) of the return pipe.

The members (4c) and (4d) of the module (4) are flat, especially rectangular, section adaptors in communication with the conduits (4a) and (4b), and on which the complementary-section connectors (5) can be engaged.

Advantageously, the flat-section connectors (5) are made integral, directly or by being connected, with

round-section adaptors (5a) able to be connected by watertight engagement with the corresponding parts of the pipes (1a, 1b) and (2a, 2b) (Figure 1).

5 The module (4) is an independent add-on element fixed in a watertight manner in the common connecting part (C) between the two compartments (A) and (B). More specifically, the module (4) has in section a profile able to fit in a complementary profile (3a) serving as
10 a bearing cradle formed in the thickness of a watertight separating partition (3). It may be fixed, for example, by means of screws (6) in combination with a seal (7) placed in the bottom of the bearing cradle (3a).

15 Note that in one particular embodiment of the filtration unit, the module (4) and the two compartments (A) and (B) are connected together by a common linking frame (not shown) fitted with covers for
20 closing each of the said compartments.

Because the connecting module (4) and the corresponding connectors (5) are so low, it is possible to minimize the height of the common linking part (C), in such a
25 way that the complete filtration unit, once installed in a straddling position sitting on the corresponding edge of the swimming pool, rises above it by only a small height which is at the very most less than the height generally accepted when using round-section
30 piping through the common linking part.

Clearly, the dimensions of the connecting adaptors (4c) and of the corresponding connectors (5) are suitable for the desired flowrate. As a guide, if using 75-mm
35 diameter pipe elements, the connecting adaptors (4c) and (4d) and the connectors (5) may have a thickness of approximately 25 mm while pointing out that this thickness may be further reduced if the width is increased in order to give an equivalent cross section

so as to suit the flowrate.

The advantages will be obvious from the description.